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CORRECTIVE ACTION PLAN FOR AREA OF CONCERN 659 (AOC 659) ZONE H ADDENDUM I CNC CHARLESTON SC

1/1/2003

CH2M HILL

CORRECTIVE ACTION PLAN
FOR
AREA OF CONCERN (AOC) 659, ZONE H

ADDENDUM I

Charleston Naval Complex
Charleston, South Carolina

SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Contract Number N62467-99-C-0960

January 2003

CORRECTIVE ACTION PLAN
ADDENDUM I
FOR
AOC 659, ZONE H

Charleston Naval Complex
Charleston, South Carolina

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston, South Carolina 29406

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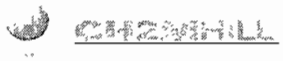

Contract Number: N62467-99-C-0960

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ACRONYMS

AOC	Area of Concern
bls	below land surface
BTEX	benzene, toluene, ethylbenzene and xylenes
BRAC	Defense Base Realignment and Closure Act
CAP	Corrective Action Plan
CNC	Charleston Naval Complex
CoC	Chemical of Concern
CSAP	Comprehensive Sampling and Analysis Plan
DOT	Department of Transportation
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
EPA	Environmental Protection Agency
ft bls	feet below land surface
mg/kg	microgram per kilogram
mg/L	microgram per liter
OVA	Organic Vapor Analyzer
PAHs	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PVC	polyvinyl chloride
QA	Quality Assurance
QC	Quality Control
RA	Rapid Assessment
RAR	Rapid Assessment Report
RBSL	Risk-Based Screening Level
RCRA	Resource Conservation Recovery Act
SCDHEC	South Carolina Department of Health and Environmental Control
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SSTL	Site-Specific Target Level
SWMU	Solid Waste Management Unit
TTNUS	Tetra Tech NUS
UST	Underground Storage Tank

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1.0 INTRODUCTION

This Corrective Action Plan (CAP) has been prepared by CH2M-JONES, LLC. The plan is designed for AOC (Area of Concern) 659, Zone H; located at the Charleston Naval Complex (CNC), Charleston, South Carolina. The South Carolina Department of Health and Environmental Control (SCDHEC) has designated this site as Identification Number: N/A.

This CAP-Addendum provides a method for Aggressive Fluid Vapor Recovery (AFVR) in order to remove the free product in monitoring wells.

1.1 General Site Description

The CNC is located in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina (**Figure 1**). This installation consists of two major areas: an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River. The site is located within the developed portion of the base (**Figure 2**).

The area surrounding CNC is "mature urban", having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek. A site vicinity map, which exhibits adjacent properties and structures, vicinity roads, current utilities, and vicinity surface drainage, is included as **Figure 2**.

1.2 Site Background

The CNC began operations in 1901, when the Navy acquired the property. In 1993, the CNC was added to the list of bases schedule for closure under the Defense Base Realignment and Closure Act (BRAC). BRAC regulates the closure of the base and transition of the property back to the community. With the scheduled closure of the base, environmental cleanup has proceeded to make the property available for redevelopment after closure.

AOC 659 consisted of Building 14, which was a 30,000-gallon, welded-steel Aboveground Storage Tank (AST). The tank was enclosed in a five (5) foot high earthen berm. From 1958 to 1990, it was used to store diesel fuel for small crafts. Prior to 1958, the site was undeveloped tidal marsh. On July 5, 1996 the *Final RCRA Facility Investigation Report for Zone H,* dated June 18, 1998 was completed by Ensafe. There were no VOC, SVOCs, cyanide, metals, or pesticides/PCBs found in soils during the investigations in the 1996 Investigation Report. The only chemical of concern found was Total Petroleum Hydrocarbons (TPHs). The TPH was found at all four of the soil sample locations **(see Figure 3)**, and in six of the eight samples analyzed. Of the six TPH detections, three were from the 0-1 foot depth interval and three samples were collected from the 3-5 foot interval.

On June 6, 1997 two sampling locations (659GP00215 and 659GP00115) were analyzed for VOCs, and SVOCs. No constituents of concern were above the RBSLs (see Attachment I).

In a letter dated November 24, 1997, SCDHEC concured with the Navy's recommendation to transfer AOC 659 to the UST program.

2.0 FINAL RCRA FACILITY INVESTIGATION REPORT

A Final RCRA Facility Investigation Report was completed on July 5 1996, for AOC 659, Zone H. The IR (investigation report) information was used to develop this CAP. The information from the IR is summarized in this section.

2.1 Assessment Information

Four soil samples were collected from two depth intervals (0 to 1 foot and 3 to 5 foot) near AOC 659.

All four samples were analyzed for VOCs, SVOCs, pesticides/PCBs, cyanide, metals, and TPH. One was split to serve as a QC duplicate, and additionally analyzed for herbicides, hexavalent chromium, dioxins, and organophosphate pesticides.

For groundwater monitoring, two groundwater samples were installed near AOC 659. Samples were analyzed for VOCs and SVOCs.

2.2 Soil Analytical Results

All information below was obtained from the Final RCRA Facility Investigation Report (Zone H) from July 5, 1996.

Soil Boring No:	INTERVALS	VOCs	SVOCs	Pesticides/ PCBs	Inorganic Elements in Soil
659SB00401	1 (0-1 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00402	2 (3-5 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00301	1 (0-1 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00302	2 (3-5 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00201	1 (0-1 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00202	2 (3-5 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00101	1 (0-1 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs
659SB00102	2 (3-5 ft)	Below RBSLs	Below RBSLs	Below RBSLs	Below RBSLs

*BDL= Below Detection Limits.

2.3 Groundwater Analytical Results

All information below was obtained from the Final RCRA Facility Investigation (Zone H) Report from July 5, 1996.

MW ID Number	VOCs	SVOCs
659GP00115	Below RBSLs	Below RBSLs
659GP00215	Below RBSLs	Below RBSLs

3.0 PROPOSED ACTIVE REMEDIATION

3.1 Corrective Actions

Active remediation at the site will include an Aggressive Fluid – Vapor Recovery (AFVR) event or multiple events will be conducted to remove free product from the source area. In addition, if free product continues to persist at the site and/or groundwater contaminant concentrations do not decrease, bioremediation may be used to target specific locations to enhance the natural degradation of the contamination at the site.

All monitoring wells will be used as potential target wells. Any free product and contaminated groundwater from the AFVR event will be containerized in a tanker vehicle and disposed at an appropriate facility based upon fluid contents.

The former UST basin and its associated contaminant plume will be the target area if bioremediation is warranted at the site. An SCDHEC-approved bioremediation product will be utilized at the site. The bioremediation product will be delivered into the contaminated zone through injection points typically installed using direct push technology in a grid pattern over the target area.

SCDHEC will be contacted prior to the implementation of the different remedial approaches at the site, if AFVR and bioremediation is warranted at the site.

3.2 AFVR Schedule

Wells U659GW001, U659GW003, and U659GW004 will be the targeted wells for the AFVR operations. All three monitoring wells are two-inch flush mounted wells. Prior to the AFVR operations all monitoring wells will be gauged for depth to water and depth to product. A log will be maintained during AFVR recording dates, times, and all readings necessary to complete the operation.

After each round of AFVR, all monitoring wells will be re-gauged for depth to water and depth to product.

4.0 PROPOSED SAMPLING PLAN

4.1 Sampling and Analysis Plan

After the AFVR events are completed the monitoring wells will be gauged for free product. If no free product is encountered then all monitoring wells will be sampled. Wells will be sampled for BTEX/Naphthalene and PAHs on a bi-annual bases.

analyzed for the following: BTEX using method 8260 and PAHs using method 8270.

All sampling procedures will be conducted in accordance with EPA EISOPQAM, and Ensafe/ Allen & Hoshall, Comprehensive Sampling and Analysis Plan, 1996.

4.2 Reporting

A report will be submitted to SCDHEC following each sampling event. The reports will summarize and include copies of field and laboratory analytical data.

5.0 REFERENCES

Comprehensive Sampling and Analysis Plan (Ensafe/ Allen & Hoshall. July 1996).

South Carolina Department of Health and Environmental Control. 1997. Corrective Action Guidance.

Tetra Tech NUS, Inc. July 1996. Final RCRA Facility Investigation Report for Zone H, Charleston, South Carolina.

United States Environmental Protection Agency. 1990. Code of Federal Regulations 136.

United States Environmental Protection Agency. 1996. EPA Environmental Investigations Standard Operating Procedures for Quality Assurance Manual.

FIGURES

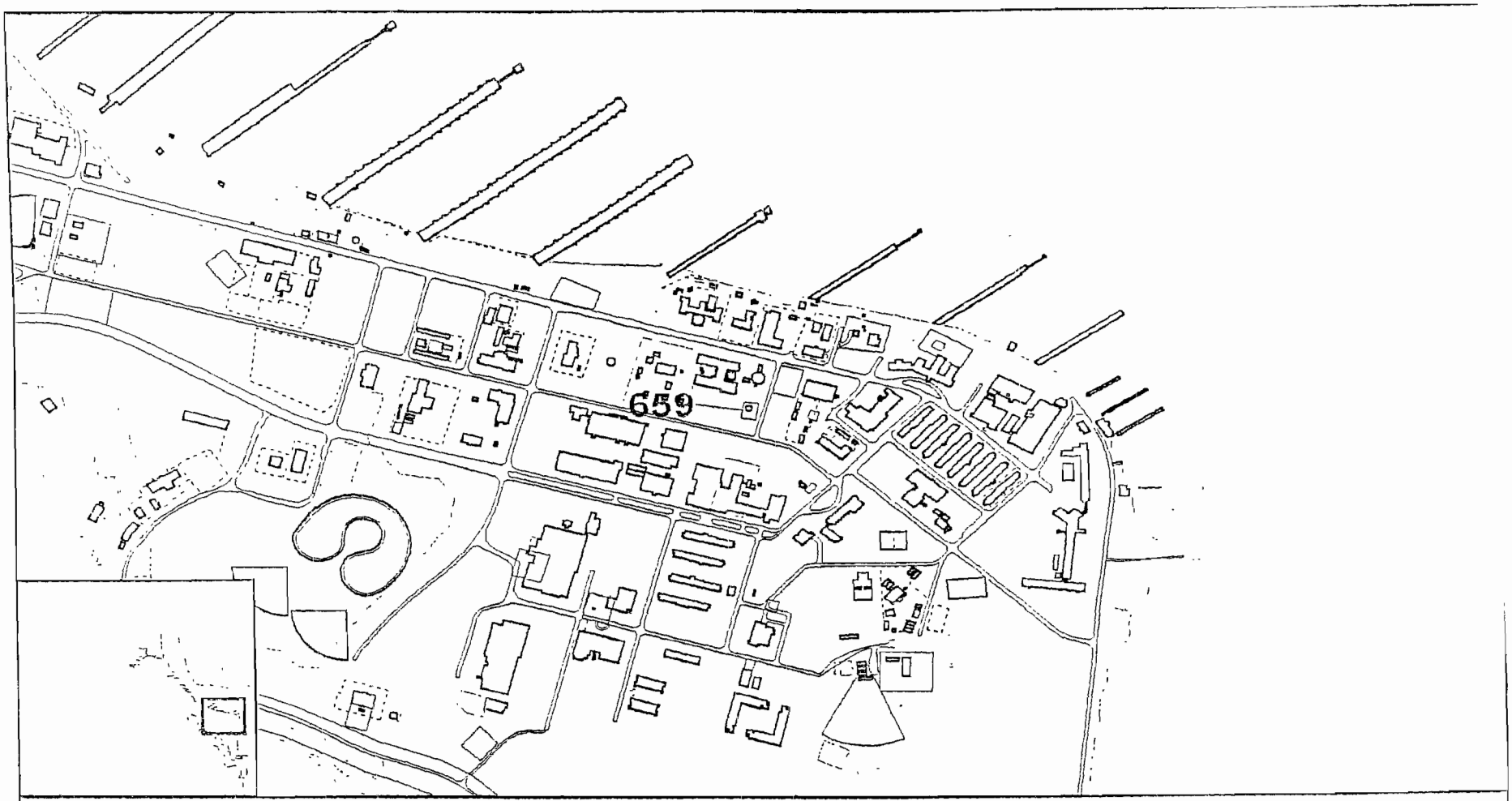

Figure 1
AOC 659
Zone H
Charleston Naval Complex

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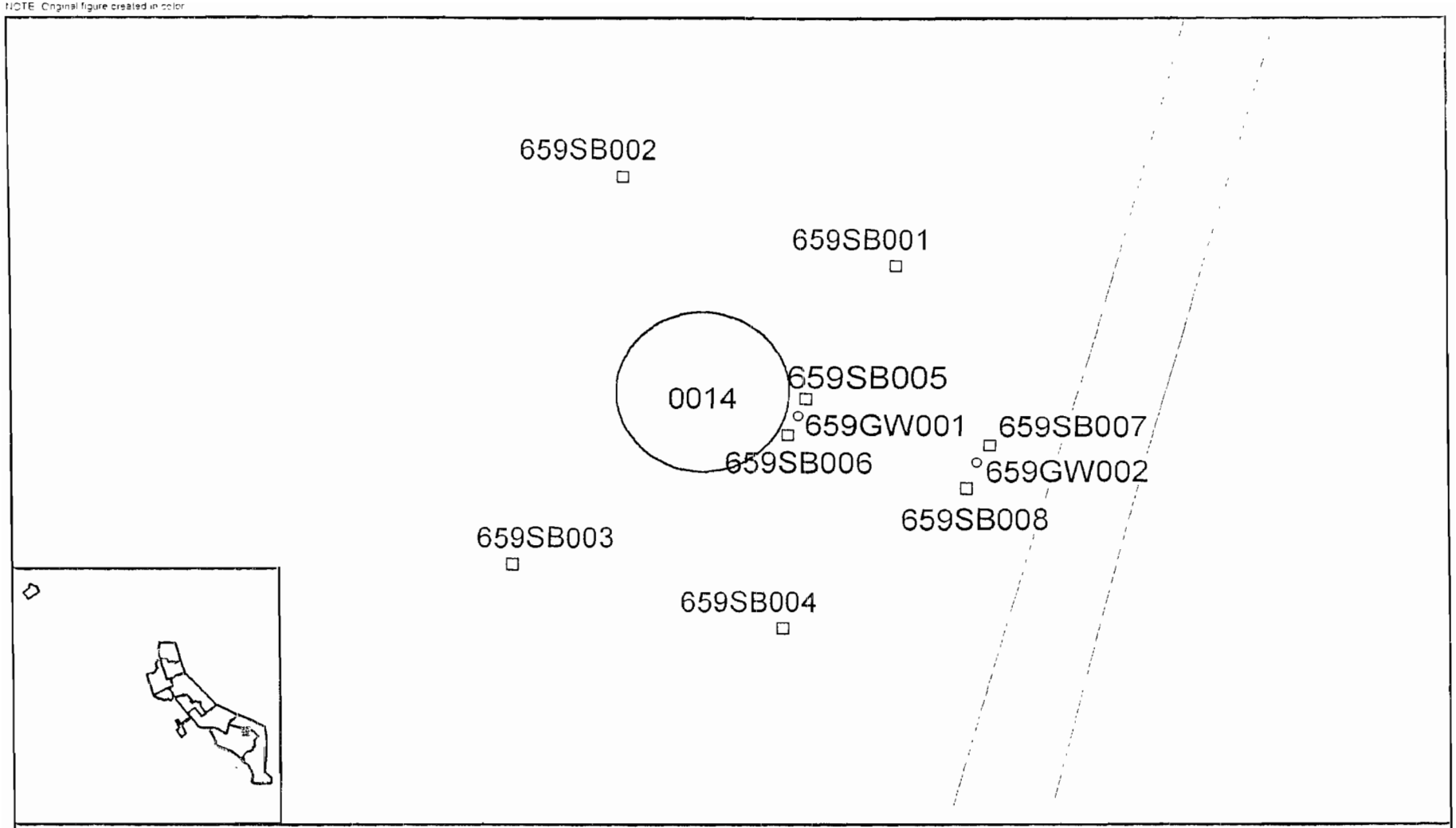

Figure 2
Site Sample Locations
AST NS14 (AOC 659)
Charleston Naval Complex

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File Path: C:\18gis\CNC\cnc-egis.apr Date: 31 Dec 2001 11:08, Unknown User: EGIS: Charleston Naval Complex - Figure 2 Site Sample Locations

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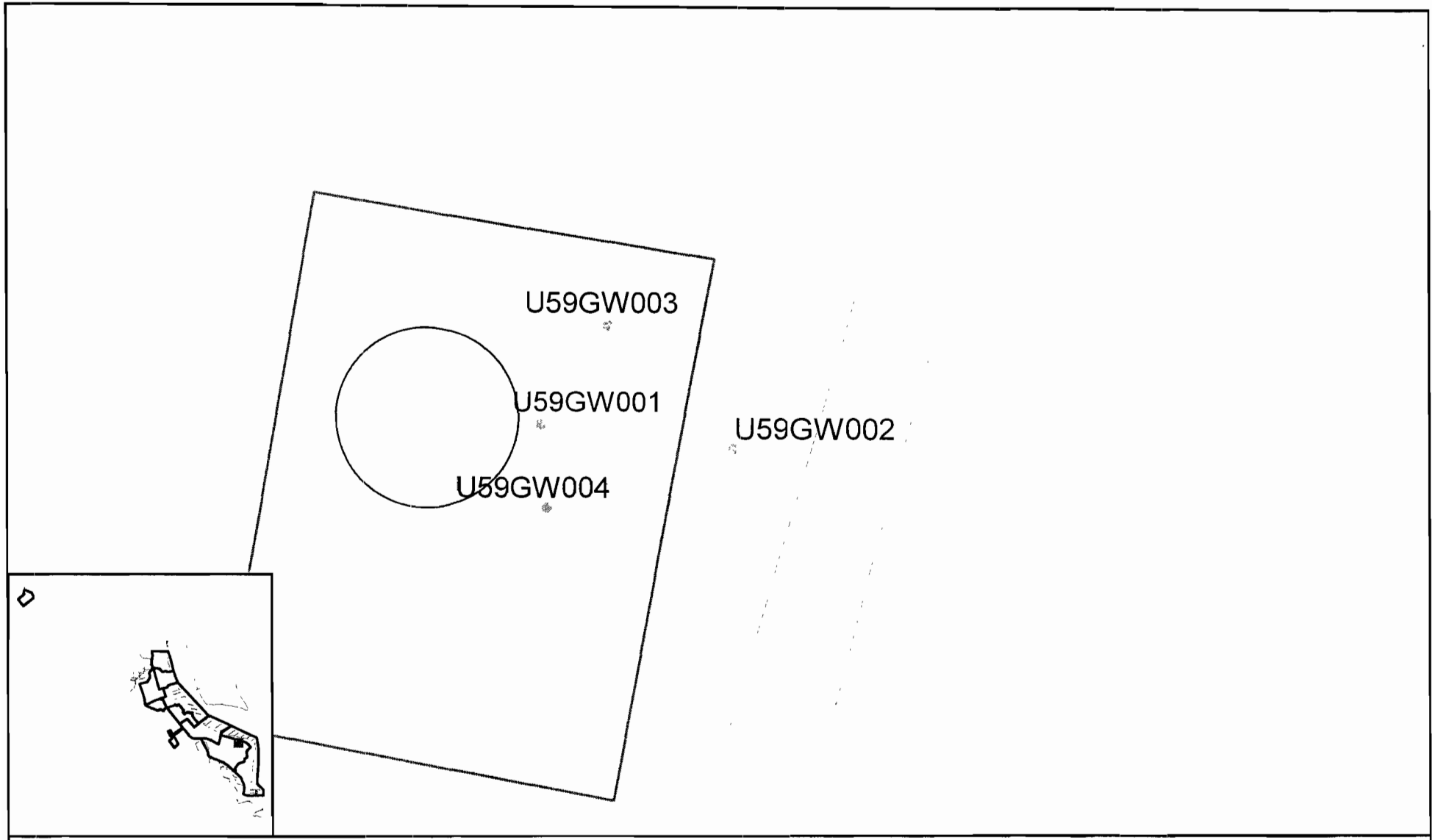

Figure 3
Monitoring Wells
659
Charleston Naval Complex

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